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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/814,511	03/22/2001	Carol Linda Thompson	10961404-1	4395

22879 7590 03/11/2004

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EXAMINER

KENDALL, CHUCK O

ART UNIT	PAPER NUMBER
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2122

DATE MAILED: 03/11/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/814,511

Applicant(s)

THOMPSON ET AL.

Examiner

Chuck O Kendall

Art Unit

2122

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 March 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: _____

DETAILED ACTION

1. This action is in response to the application filed 03/22/01.
2. Claims 1-14 have been examined.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

4. Claims 1 - 14 are rejected under 35 U.S.C. 102(e) as being anticipated by Sreedhar et al. USPN 6,182,284 B1 (hereinafter "Sreedhar").

Regarding claim 1, a computer-implemented method for a .PHI. function providing a mechanism for single static assignment in the presence of predicated code, the method comprising the steps of:

introducing an associated ordered guard on each source operand in a control or predicate .PHI. instruction (Col. 22: 45 – 62, for predicate see, declare);

materializing a .PHI. function by inserting at least one copy from each source operand to a target variable in the same order as said source operand (Col.2: 63 – 67);
and

predicating each of said copies by said ordered guard associated with said source operand (Col. 22: 45 – 62).

Regarding claim 2, the method of claim 1, further comprising:

transforming a source code by writing a result of a compare operation on a variable in said source code to a predicate (Col. 37:53 – 63, also 41:60 – 62);

representing said transformed source code in static single assignment form using said .PHI. function having source operands (Col.41:60 – 62);

materializing said .PHI. function and eliminating any unnecessary copies from said source operands (Col.2:50 – 54).

Regarding claim 3, the method of claim 1, further comprising the steps of: ordering said source operands according to a topological ordering of the source code blocks (Col.25: 38 – 45);

and

maintaining said topological ordering through any subsequent code transformations (Col.25: 40 – 43, see traversal order).

Regarding claim 4, the method of claim 3, wherein said topology is determined by a compiler (Col.21: 45 – 55, talks about sequence of execution and compiler).

Regarding claim 5, the method of claim 4, further comprising the steps of: the compiler taking a stream of said source code;

the compiler identifying the blocks and edges of said source code (Col. 41:55 – 65); and

the compiler topologically numbering said blocks (Col.23: 20 – 30, see indexing with integer values).

Regarding claim 6, the method of claim 1, comprising the step of: inserting a predicate .PHI. function after each existing predicated assignment (Col.25:17 – 35, see declare and insert).

Regarding claim 7, the method of claim 6, wherein said predicate .PHI. function is constructed during the initial construction of single static assignment form (Col.2:57 – 63).

Regarding claim 8, the method of claim 6, wherein said guard on said predicate .PHI. functions indicates a predicate under which said associated source operand is live (Col.2:57 – 63, see live).

Regarding claim 9, the method of claim 6, wherein said predicate .PHI. function is constructed while already in static single assignment form (Col.2:50 – 60, see SSA).

Regarding claim 10, the method of claim 1, further comprising the step of either replacing or augmenting a control .PHI. function with a predicate .PHI. function (Col.14: 10 – 20).

Regarding claim 11, the method of claim 10, wherein said guard on said control .PHI. functions indicates the basic block which is the source of the edge associated with said source operand (Col. 5:20-30).

Regarding claim 12, the method of claim 1, wherein said ordered guards indicate the condition under which an associated source operand is live (Col.2:57 – 63, see live).

Regarding claim 13, Sreedhar anticipates a computer implemented method for a .PHI. function providing a mechanism for single static assignment in the presence of predicated code, the method comprising the steps of:

- transforming a source code by writing a result of a compare operation on a variable in said source code to a predicate (Col. 37:53 – 63, also 41:60 – 62);

- representing said transformed source code in static single assignment form using a .PHI. function having source operands (Col.41:60 – 62);

- introducing an associated ordered guard on each source operand in a block of said source code (Col. 22: 45 – 62, for predicate see, declare);

- ordering said source operands according to a topological ordering of the source code blocks(Col.25: 38 – 45);

- maintaining said topological ordering through any subsequent code transformations(Col.25: 40 – 43, see traversal order);

- materializing said .PHI.function by inserting at least one copy from each source operand to a target variable in the same order as said source operand (Col.2: 63 – 67);
- ; and

- eliminating any unnecessary copies from said source operands (Col.2:50 – 54).

Regarding claim 14, which recites the system version of claim 13, see rationale as previously discussed above.

Art Unit: 2122

Correspondence Information

5. Any inquires concerning this communication or earlier communications from the examiner should be directed to Chuck O. Kendall who may be reached via telephone at (703) 308-6608. The examiner can normally be reached Monday through Friday between 8:00 A.M. and 5:00 P.M. est.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tuan Dam *can be* reached at (703) 305-4552.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 305-3900.

For facsimile (fax) send to central FAX number 703-872-9306 and 703-7467240 draft.

Chuck Kendall

Patent Examiner AU 2122



Todd Ingberg
Primary Examiner
Group 2100